



Problem of the Week

Problem C and Solution

Kitchen Sized

Problem

The rectangular floor plan of the first level of a house is shown in the following diagram. Both the laundry room and the dining room are square with areas of 4 m^2 and 25 m^2 , respectively. The living room is rectangular with an area of 30 m^2 . Determine the area of the kitchen.

Solution

Let the width of a room be the distance represented top to bottom on the diagram. Let the length of a room be the distance represented horizontally on the diagram.

The dining room is a square and has an area of 25 m^2 . Its length and width must both be 5 m since $\text{Area} = 5 \times 5 = 25 \text{ m}^2$. The width of the dining room and living room are the same. So the width of the living room is 5 m . But the area of the living room is 30 m^2 so the length of the living room is 6 m since $\text{Area} = 5 \times 6 = 30 \text{ m}^2$.

The laundry room is a square and has an area of 4 m^2 . Its length and width must both be 2 m since $\text{Area} = 2 \times 2 = 4 \text{ m}^2$. The width of the laundry room and kitchen are the same. So the width of the kitchen is 2 m .

Now the length of the whole house can be calculated in two ways. We will equate these two expressions to find the length of the kitchen.

$$\begin{array}{rcl}
 (\text{Length of Laundry Room} & & (\text{Length of Living Room} \\
 + \text{Length of Kitchen}) & = & + \text{Length of Dining Room}) \\
 2 + \text{Length of Kitchen} & = & 6 + 5 \\
 2 + \text{Length of Kitchen} & = & 11 \\
 \text{Length of Kitchen} & = & 9 \text{ m}
 \end{array}$$

Since the width of the kitchen is 2 m and the length of the kitchen is 9 m , the area of the kitchen is $2 \times 9 = 18 \text{ m}^2$.

